

REMARKS

The Examiner rejected claims 1, 2, and 5-8 under 35 U.S.C. §102(b) as allegedly being anticipated by Ito et al. (US 6,274,505).

The Examiner rejected claims 1-16 under 35 U.S.C. §103(a) as allegedly being unpatentable over Futase et al. (JP 11-245143) in view of Ito et al. (US 6,274,505).

Applicants respectfully traverse the §102 and §103 rejections with the following arguments.

35 U.S.C. §102(b)

The Examiner rejected claims 1, 2, and 5-8 under 35 U.S.C. §102(b) as allegedly being anticipated by Ito et al. (US 6,274,505).

Applicants respectfully contend that Ito does not anticipate claim 1, because Ito does not teach each and every feature of claim 1. For example, Ito does not teach the feature: "directing a second fluid against a portion of the lower surface proximate to the edge of the substrate, wherein said second fluid flows adjacent to the edge of the substrate".

Applicants respectfully contend that in Ito, the second fluid cannot be directed against a portion of the lower surface of the substrate 102, because the second fluid is contained within the device 104 shown in FIG. 1 and FIG. 9 of Ito and has no direct physical contact with the substrate. Thus, it is physically impossible for the second fluid to be directed against any portion of the substrate 102.

Moreover, Ito does not disclose anywhere that the second fluid in the device 104 has a velocity component that is perpendicular to the lower surface of the substrate 102. To the contrary, FIG. 2 of Ito shows the second fluid as having a spiral flow in a direction that is parallel to the lower surface of the substrate 102. Since Ito does not teach that the second fluid in the device 104 has a velocity component that is perpendicular to the lower surface of the substrate 102, Applicants again argue that it is physically impossible for the second fluid to be directed against any portion of the substrate 102.

As another example, Ito does not teach the feature: "controlling the temperature of said second fluid in order to affect a processing of an edge region of the upper side of the substrate".

In particular, Ito does not teach that controlling the temperature of the second fluid affects the processing of an edge region of the substrate. FIGS. 1 and 9 show the edge regions of the substrate 102 as extending beyond the length of the device 104 (i.e., to the left and right of device 104). Therefore, the edge regions of the substrate 102 are beyond the field of influence of the second fluid that flows in the device 104. This is confirmed in FIG. 6 and 7 of Ito which show that the high temperature at the edge regions of the substrate 102 are unchanged between FIGS. 6 and FIG. 7 and therefore are not affected by the second fluid flowing in the device 104. Only the portion of the substrate 102 that is directly above the device 104 is changed between FIGS. 6 and 7.

Based on the preceding arguments, Applicants respectfully maintain that Ito does not anticipate claim 1, and that claim 1 is in condition for allowance. Since claims 2 and 5-8 depend from claim 1, Applicants contend that 2 and 5-8 are likewise in condition for allowance.

35 U.S.C. §103(a)

The Examiner rejected claims 1-16 under 35 U.S.C. §103(a) as allegedly being unpatentable over Futase et al. (JP 11-245143) in view of Ito et al. (US 6,274,505).

Applicants respectfully contend that claims 1 and 13 are not unpatentable over Futase in view of Ito, because Futase in view of Ito does not teach or suggest each and every feature of claims 1 and 13. For example, Futase in view of Ito does not teach or suggest the feature: "controlling the temperature of said second fluid in order to affect a processing of an edge region of the upper side of the substrate" (claim 1) and "maintaining the temperature of said suspension fluid at a temperature different from an ambient temperature while delivering said processing fluid" (claim 13).

The Examiner admits: "Unlike claimed invention, Futase doesn't describe controlling or maintaining the temperature, T, of the suspension fluid at temperature different from the ambient temperature in order to affect the processing of an edge region of the top surface of the substrate."

The Examiner argues: "Ito describes a method for processing a substrate comprising processing the upper surface with a solution (col. 7, line 4-5) and supplying a fluid against the lower surface including the circumferential portion or edge of the substrate and controlling the T of the fluid by heating or cooling it (claimed maintaining it at T different from the ambient T) (col. 4, line 20-25; col. 7, line 20-34; col. 8, line 17-24, line 34-42; col. 10, line 39-47). It would have been obvious for one skill in the art at the time of the invention to modify Futase in light of Ito because Ito teaches that controlling the T by heating or cooling the T would provide uniform T profile of the substrate and improve the etching uniformity over entire of the surface (col. 3, line 45-col. 4, line 5)".

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Applicants respectfully contend that the Examiner's argument is not persuasive, because Ito does not disclose "supplying a fluid against the lower surface including the circumferential portion or edge of the substrate" as alleged in the preceding argument by the Examiner, as explained in Applicants' argument *supra* in relation to the §102(b) rejection of claim 1.

In addition, Applicants respectfully contend that the Examiner's argument for modifying Futase by the alleged teaching of Ito is not persuasive for several reasons. A first reason why the Examiner's argument for modifying Futase by the alleged teaching of Ito is not persuasive is that Futase does not teach or suggest that Futase's disclosed etching method has spatial nonuniformity in need of improvement. Thus there is no suggestion in the prior art to support the modification of Futase by the alleged teaching of Ito for controlling the temperature of the second fluid in Futase. Established case law requires that the prior art must contain some suggestion or incentive that would have motivated a person of ordinary skill in the art to modify a reference or to combine references. See also *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the motivation obvious unless the prior art suggested the desirability of the modification."). Here, the Examiner's reason for the modification of Futase is without evidentiary support in the prior art, since there is no teaching or suggestion by Futase that Futase's disclosed etching method has spatial nonuniformity in need of improvement.

A second reason why the Examiner's argument for modifying Futase by the alleged teaching of Ito is not persuasive is that it is physically impossible to modify Futase by the alleged teaching of Ito. Ito teaches controlling the temperature of the second fluid by flowing the second fluid in the device 104 shown in FIG. 1 and FIG. 9 of Ito. However, the second fluid in

Futase cannot be flowed in such a device as taught by Ito, because as shown in FIG. 12 of Futase the second fluid in Futase must flow in the space between the stage 102 and the wafer 1 to permit the wafer 1 to be floated (see Futase, col. 13, line 66 - col. 14, line 3). Thus, the enablement allegedly taught in Ito for flowing the second fluid in such a device for controlling the temperature of the second fluid cannot be used to modify Futase, since flowing the second fluid in the device instead of between the stage 102 and the wafer 1 of Futase would destroy Futase's invention.

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 13 are not unpatentable over Futase in view of Ito, and that claims 1 and 13 are in condition for allowance. Since claims 2-12 depend from claim 1, Applicants contend that claims 2-12 are likewise in condition for allowance. Since claims 14-16 depend from claim 13, Applicants contend that claims 14-16 are likewise in condition for allowance.

In addition, the dependent claims have additional patentable features. For example, claim 15 is not unpatentable over Futase in view of Ito, because Futase in view of Ito does not teach or suggest the features: "sensing the temperature of said suspension fluid proximate to said annular opening; and controlling the temperature of said suspension fluid proximate to said annular opening to a predetermined value".

The Examiner argues: "Referring to claim 15, Ito suggests using a sensor to control the temperature of the fluid (col. 8, line 30-33, line 55-60). Therefore, it would have been obvious at the time of the invention for one skill in the art to use a T sensor in order to sense the T at the edge of the substrate to provide an uniform T profile of the substrate for etching with a

reasonable expectation of success".

In response, Applicants respectfully contend that Ito discloses only the use of a sensor in col. 8, line 33. Ito does not anywhere disclose use of a temperature sensor. Thus, Ito most certainly does not disclose "sensing the temperature of said suspension fluid proximate to said annular opening".

Moreover, a sensor is a sensing device and does not perform a controlling functionality, by definition. Thus, Ito most certainly does not disclose "controlling the temperature of said suspension fluid proximate to said annular opening to a predetermined value".

Accordingly, Applicants respectfully maintain that the Examiner has not established a *prima facie* case of obviousness in relation to claim 15. Thus, claim 15 is not unpatentable over Futase in view of Ito.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

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